

5610

REMARKS

The applicant expresses thanks to the Examiner for her kind attention to this application, and for the recent Office Action.

The Pending Claims

Claims 14-17 and 19-25 currently are pending in the application. In the most recent Office Action, the previous section 112 objections were withdrawn.

Claims 1-13, 18, 23-25 have been canceled without prejudice.

Claims 14, 16 and 22 were rejected under section 112 as indefinite. It was suggested that the drying step be clarified. The indicated claims have been amended as suggested by the examiner.

Claims 22, 23 and 25 were rejected under section 102(b) as anticipated by U.S. Patent No. 4,290,766 to Burns, Jr. et al. ("Burns").

Claims 14, 15, 19, 20, 24 were rejected under section 102 and/or section 103 as obvious over Burns.

Claims 16, 17 and 21 are rejected under section 103 as unpatentable over Burns in light of US 3,849,159 to Palmer et al. ("Palmer")

Section 112

Applicant traverses the rejections stated above, and submits that applicant has complied with section 112 of the Patent Act. That is, the invention is described in the specification in writing, including the manner and process of using it, in terms that enable a person of skill in the art to make and use the invention.

Page 13 of the specification of the application reference radio frequency drying is provided, and as such, this clarifying language has been added to the claim.

The Burns Prior Art

The claims have been substantially amended to clarify novel and nonobvious aspects of the invention.

Claim 14:

Claim 14 includes the limitation that the fabric is polyester, and the dye is provided in an aqueous process in an unfixed state. Further, the drying occurs by application of radio frequency energy to the fabric, which has been found to provide an excellent manner of heating the wet fabric to drive off water, but without fixing a

5610

substantial portion of dye. Then, the fabric is etched using a yarn degrading composition of an alkaline paste. Then, the dye is fixed.

Further, a color contrast is formed between the first and second regions, which provides a positive delta L value differential between the first regions and the second regions. This color contrast is caused by special processing conditions of the invention. It is believed that this color contrast is caused by the method of applying dye in an unfixed state in a wet process, and then only later fixing the dye, after a caustic alkaline paste is applied.

Data showing the remarkable and unexpected color contrast is provided below. In the practice of the invention, it is possible to control the relative value or the change in delta L* value within a given sample, so as to regulate or "tune" the difference in delta L* value. It is possible to regulate this difference or change by controlling process variables which include the process conditions, including the drying conditions, printing conditions.

Burns discloses 7 examples, all of which relate to ACRYLIC fabric, not polyester. Further, Burns discloses ethylene carbonate, an ester. Burns does not disclose using alkaline caustic for etching. Thus, the Burns substrate and etch process is significantly different.

Burns does not actually teach any enabling disclosure of a method of applying of unfixed dye to a polyester in an aqueous process, drying with radio frequency drying, and then etching with alkaline paste, followed by fixing the dye. Instead, Burns teaches applying dyes and sculpting compositions from guns bars, applied simultaneously. See column 6, lines 25 to 68. It is believed that Burns could not achieve the dye effects resulting in a slightly different dye shade in a first region as compared to a second region. This is in part because Burns has a steam chamber designed for sculpting and fixing the dye at the same time. This is not the same as this invention, which utilizes the technology of radio frequency to dry the fabric with unfixed dye on the fabric, in a step that occurs before any etching steps.

This radio frequency dryer gives only partial fixing of the dye, which provides a slight color change. Then, the next step of etching is followed by a fixing step at elevated temperature. By avoiding the use of elevated temperature prior to etching (i.e. in the radio frequency energy application step), a substantial and unexpected shade contrast is achieved. No such shade contrast or process for achieving such contrast is suggested by Burns. Instead, Burns uses only a step of a steam chamber.

5610

Radio frequency ("RF") drying has been applied in the invention to provide a uniform level of drying. Further, RF drying provides moisture leveling, in part due to a reduced dwell time. The RF dryer heats all parts of the product mass simultaneously and evaporates water *in situ* at relatively low temperatures.

Low temperature RF drying is important to the invention. That is because by using low temperature RF drying, it is possible to avoid fixing most of the unfixed dye in the initial steps of the process. In that manner, the slight shade effects are provided, and thus only a slight amount of dyeing occurs at this time. Then, later, when etch is applied, the textile may be steamed to fix the dyes. When that occurs, the textile has at least two pile heights, and also has a slight and very desirable shade contrast. This product is made possible in part due to the use of RF drying process.

The dyeing process is specific to the substrate and the etch used. Further, there is no reason to believe that the teachings of Burns could work on polyester, and there is no enabling disclosure in Burns of how to achieve results in polyester. Further, there is no reason to believe that a process that works for acrylic could be readily applied to polyester. Different materials and different etch compositions would provide vastly different results, and this is not predictable.

It would not be obvious to make these multiple modifications to Burns, and nothing evident in the teachings of Burns would cause someone to alter Burns and somehow achieve the invention.

Claim 16:

Claim 16 includes the additional limitation of causing differential pile height. Further, the yarns or fibers of the first region exhibit a first L value that differs from the second L value by about 10% or more. Further, a washing step is employed as well.

None of the cited prior art teaches or renders obvious the invention of this claim:

- the fabric is polyester, and
- the dye is provided in an aqueous process in an unfixed state,
- the drying occurs by application of radio frequency energy to the fabric by heating the wet fabric to drive off water, but without fixing a substantial portion of dye,

5610

--- etching, using a mask, using a yarn degrading composition of an alkaline paste,

--- and only then, fixing the dye,

— to provide a substantial shade contrast in which the yarns or fibers of the first region exhibit a first L value that differs from the second L value by about 10% or more.

There is no evidence in the Burns reference that would indicate that Burns achieves the above noted invention, and certainly no evidence that Burns provides a substantial shade contrast in which the yarns or fibers of the first region exhibit a first L value that differs from the second L value by about 10% or more.

The office action clearly indicates that Burns does not teach use of a mask for etching.

With regard to inherency, it is only appropriate to make such a finding when the property or feature would necessarily flow from or be exhibited by the disclosed prior art. There is no such evidence in this instance that any person of skill in the art, upon reading Burns, would be led to use a mask for etching.

Palmer, an embossed nylon process, is cited for its use of a mask. There is no teaching that would suggest use of the teachings of Palmer in this application, and Palmer is not compatible with Burns, since Burns teaches acrylic. The combination of Burns most likely would result in the use of acrylic with an embossing agent, and would not result in the features of the invention. This combination of Palmer and Burns does not teach or renders obvious the invention of this claim, that is:

-- the fabric is polyester, and

-- the dye is provided in an aqueous process in an unfixed state,

--- the drying occurs by application of radio frequency energy to the fabric by heating the wet fabric to drive off water, but without fixing a substantial portion of dye,

--- etching USING A MASK, using a yarn degrading composition of an alkaline paste,

--- and only then, fixing the dye,

— to provide a substantial shade contrast in which the yarns or fibers of the first region exhibit a first L value that differs from the second L value by about 10% or more.

5610

Claim 22:

Claim 22 claims additional features, including a dye fixing step of heating the fabric of step (e) in a superheated steamer, at a temperature of about 180 degrees C. Then, the fabric is washed, and dried at elevated temperature.

Burns teaches steaming at 100 degrees C (212 F) for ten minutes, see column 7, line 58. This is the dye fixing process step.

In the invention, dye is fixed in a different manner, as described above. Further, in the invention, dye is fixed at a much higher temperature than that shown in Burns.

Even the combination of Palmer and Burns does not teach or renders obvious the invention of this claim, in part because in the invention:

- the fabric is polyester, and
- the dye is provided in an aqueous process in an unfixed state,
- the drying occurs by application of radio frequency energy to the fabric by heating the wet fabric to drive off water, but without fixing a substantial portion of dye,
- etching using a yarn degrading composition of an alkaline paste,
- and only then, fixing the dye,
- to provide a substantial shade contrast in which the yarns or fibers of the first region exhibit a first L value that differs from the second L value by about 10% or more.

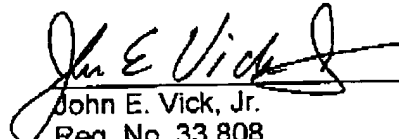
The combination of Palmer and Burns would not result in the invention.

5610

Conclusion

In view of the foregoing, the application is considered in proper form for allowance, and the Examiner is respectfully requested to pass this application to issue. Any fees needed may be charged to Deposit Account No. 04-0500. The Examiner is invited to phone if it would be helpful.

Respectfully submitted,



John E. Vick, Jr.
Reg. No. 33,808

MILLIKEN & COMPANY, M-495
920 Milliken Road
Spartanburg, SC 29303
Telephone: (864) 503-1383
Facsimile: (864) 503-1999